

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. – 30. (cancelled)

31. (previously presented) A method to assess the inhibitory activity of a test substance on a polypeptide that comprises SEQ ID NO:2, the method comprising:  
contacting the polypeptide with the test substance in the presence of a carboxylate, wherein the polypeptide has been expressed by a cell; and  
detecting the amount of carboxylate transported by the polypeptide in the presence and absence of the test substance, wherein inhibition of transport in the presence as compared to the absence of the test substance indicates that the test substance is a cellular transporter inhibitor.

32. (previously presented) The method of claim 31 wherein the polypeptide is expressed in a *Xenopus* oocyte comprising an Indy mRNA.

33.-55. (cancelled)

56. (currently amended) A method to assess interaction of a test molecule with a transporter polypeptide, the method comprising:

providing a transporter polypeptide that comprises SEQ ID NO:2,  
contacting the transporter polypeptide with a test molecule; and  
detecting binding of the test molecule to the transporter polypeptide, thereby assessing interaction of the test molecule with the transporter polypeptide.

57. (cancelled)

58. (previously presented) A method to assess interaction of a test molecule with a transporter polypeptide, the method comprising:

providing a transporter polypeptide that comprises SEQ ID NO:2, wherein providing the transporter polypeptide comprises expressing the transporter polypeptide in a host cell such that the transporter polypeptide is present at the cell surface;  
contacting the transporter polypeptide with a test molecule; and  
detecting the transport activity in the presence and absence of the test molecule, wherein the step of detecting comprises contacting the transporter polypeptide with a carboxylate and assaying transport of the carboxylate, and wherein an alteration in the transport activity in the presence as compared to the absence of the test substance indicates that the test substance is a modulator of the transporter polypeptide.

59-61. (cancelled)

62. (previously presented) The method of claim 58, wherein the carboxylate is selected from the group consisting of succinate, alpha-ketoglutarate, fumarate, and citrate.

63. (previously presented) The method of claim 62, wherein the carboxylate is succinate.

64. (previously presented) The method of claim 58, wherein the host cell is a *Xenopus* oocyte.

65. (previously presented) The method of claim 58, wherein the host cell is a mammalian cell.

66. (previously presented) The method of claim 56, 58, or 61, wherein the test molecule is selected from the group consisting of antibodies, peptides, nucleic acid molecules, and small organic molecules.

67-72. (cancelled)

73. (previously presented) A method to assess a test molecule for ability to modulate expression of a transporter polypeptide, the method comprising:  
providing a cell that contains a nucleic acid encoding a transporter polypeptide that comprises SEQ ID NO:2;  
contacting a test molecule to the cell; and  
detecting expression of an mRNA that encodes the transporter polypeptide to determine whether the test molecule has the ability to modulate expression of the transporter polypeptide in the cell.

74. (cancelled)

75. (currently amended) A method to assess transport activity by a transporter polypeptide, the method comprising:

providing a cell that contains a nucleic acid encoding a transporter polypeptide that comprises SEQ ID NO:2;

contacting a substrate of the transporter polypeptide to the cell; and

detecting the substrate to determine transport of the substrate into the cell,

~~assessing transport of the substrate by the transporter polypeptide,~~ thereby assessing transport activity of the transporter polypeptide.

76. (previously presented) The method of claim 75 wherein the contacting is in the presence of a test molecule.

77. (previously presented) The method of claim 75 wherein the substrate is a carboxylate.

78. (previously presented) The method of claim 77 wherein the substrate is succinate.

79. (previously presented) The method of claim 75 wherein the substrate is labeled.

80. (previously presented) The method of claim 75 wherein the transporter polypeptide is produced from a heterologous nucleic acid in the cell.

81. (cancelled)

82. (previously presented) A method to assess the inhibitory activity of a test substance on a polypeptide that comprises SEQ ID NO:3, the method comprising:

contacting the polypeptide which has been expressed by a cell with the test substance; and

detecting the amount of carboxylate transported by the polypeptide in the presence and absence of the test substance by evaluating transport in the presence of a carboxylate, wherein inhibition of transport in the presence as compared to the absence of the test substance indicates that the test substance is a cellular transporter inhibitor.

83. (currently amended) A method to assess interaction of a test molecule with a transporter polypeptide, the method comprising:

providing a transporter polypeptide that comprises SEQ ID NO:2 and that has been expressed by a first cell,

contacting the transporter polypeptide with a test molecule;

detecting interaction of the test molecule with the transporter polypeptide by contacting the transporter polypeptide with a carboxylate and assaying transport of the carboxylate or by detecting binding of the test molecule to the transporter polypeptide;

contacting the test molecule to a second cell; and

detecting rate of aging assaying lifespan extension of the second cell, thereby assessing interaction of the test molecule with the transporter polypeptide.

84. (currently amended) A method to assess interaction of a test molecule with a transporter polypeptide, the method comprising:

providing a transporter polypeptide that comprises a sequence that is selected from the group consisting of SEQ ID NO:3, 4, 5, and 6 and that has been expressed by a first cell;

contacting the transporter polypeptide with a test molecule;

detecting interaction of the test molecule with the transporter polypeptide by contacting the transporter polypeptide with a carboxylate and assaying transport of the carboxylate or by detecting binding of the test molecule to the transporter polypeptide; contacting the test molecule to a second cell; and detecting rate of aging assaying lifespan extension of the second cell, thereby assessing interaction of the test molecule with the transporter polypeptide.

85. (previously presented) The method of claim 84, wherein detecting an interaction of the test molecule with the transporter polypeptide comprises detecting transport activity of the transporter polypeptide.

86. (previously presented) The method of claim 85 wherein detecting an interaction of the test molecule with the transporter polypeptide comprises detecting transport activity in the presence and absence of the test molecule, and an alteration in the transport activity in the presence as compared to the absence of the test substance indicates that the test substance is a modulator of the transporter polypeptide.

87. (previously presented) The method of claim 85 wherein the transporter polypeptide comprises SEQ ID NO:4.

88. (previously presented) The method of claim 85 wherein the transporter polypeptide comprises SEQ ID NO:5.

89. (previously presented) The method of claim 85 wherein the transporter polypeptide comprises SEQ ID NO:6.

90. (previously presented) The method of claim 85 wherein the method is used to screen a library of chemical compounds.

91. (previously presented) The method of claim 85 wherein the test molecule is an antibody.

92. (previously presented) The method of claim 85 wherein the test molecule is a peptide.

93. (previously presented) The method of claim 85 wherein the test molecule is a small organic molecule having a molecular weight between 50 to 2,500 Daltons.

94. (previously presented) The method of claim 85 wherein the test molecule is a nucleic acid molecule selected from the group consisting of: antisense molecules, ribozyme molecules, double-stranded interfering RNAs, and triple helix molecules.

95. (currently amended) The method of claim 84 wherein detecting an interaction of the test molecule with the transporter polypeptide comprises detecting binding to the transporter polypeptide.

96. (previously presented) The method of claim 95 wherein the transporter polypeptide comprises SEQ ID NO:4.

97. (previously presented) The method of claim 95 wherein the transporter polypeptide comprises SEQ ID NO:5.

98. (previously presented) The method of claim 95 wherein the transporter polypeptide comprises SEQ ID NO:6.

99. (previously presented) The method of claim 95 wherein the method is used to screen a library of chemical compounds.

100. (previously presented) The method of claim 95 wherein the test molecule is an antibody.

101. (previously presented) The method of claim 95 wherein the test molecule is a peptide.

102. (previously presented) The method of claim 95 wherein the test molecule is a small organic molecule having a molecular weight between 50 to 2,500 Daltons.

103. (previously presented) The method of claim 84 wherein the transporter polypeptide comprises SEQ ID NO:3.

104. (previously presented) The method of claim 56 wherein the method is used to screen a library of chemical compounds.

105. (previously presented) The method of claim 58 wherein the method is used to screen a library of chemical compounds.

106. (previously presented) The method of claim 105 further comprising selecting one or more members from the library of chemical compounds that stimulate the transporter polypeptide.

107. (previously presented) The method of claim 105 further comprising selecting one or more members from the library of chemical compounds that inhibit the transporter polypeptide.



108. (currently amended) A method to assess interaction of a test molecule with a transporter polypeptide, the method comprising:

providing a transporter polypeptide that comprises a sequence that is selected from the group consisting of SEQ ID NO:3, 4, 5, and 6 and that has been expressed by a first cell;

contacting the transporter polypeptide with a test molecule;

detecting interaction of the test molecule with the transporter polypeptide by contacting the transporter polypeptide with a carboxylate and assaying transport of the carboxylate or by detecting binding of the test molecule to the transporter polypeptide;

contacting the test molecule to a second cell; and

assaying lifespan extension measuring the lifespan of the second cell, thereby assessing interaction of the test molecule with the transporter polypeptide.